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ABSTRACT

Safety belts are not installed in school buses for several reasons. School buses are constructed differently from automobiles in terms of (1) the locations of doors and instrument panels relative to passengers, (2) outer construction, (3) seat design and padding, and (4) visibility on the road. Under current regulations, bus seats are constructed so safely that wearing seat belts is more likely to increase injuries than to decrease them. Several state and national organizations concerned with safety and pupil transportation have stated that current regulations provide adequate protection and that seat belts will not enhance passenger safety. Many more students are fatally injured while waiting for or leaving their buses than while travelling in them, suggesting that safety measures associated with improved driver training, "loading zone" design, and public information are now of more significant concern than additional safety equipment. (PGD)

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School buses & seat belts

A discussion

ED267494

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Foreword

The success of seat belts in reducing injuries and deaths in automobile accidents appears at first glance to apply also to school buses. Yet school buses are not equipped with seat belts. Why not?

Next to parents, those most concerned about the safety of children on school buses are the people responsible for the pupil transportation program. These people—school bus drivers, school bus driver instructors, and school district administrators involved in the day-to-day operation of school vehicles—are familiar with the many issues concerning seat belts on school buses. The subject has been studied for many years at the national and state levels, and much information is available on both sides of the issue.

The purpose of this publication is to provide

- information on why seat belts are not installed on school buses
- research results on the use of seat belts on school buses
- the positions of national and state safety organizations on the seat belt issue.

School buses and safety

Why seat belts are used in automobiles

One purpose of seat belts is to prevent the person wearing them from being thrown out of a vehicle during a collision. But, unlike automobiles, school bus seats are not located opposite a door which could open and allow passengers to be ejected upon impact. School buses usually have only two doors. Neither is located beside a passenger seat.

A second purpose of seat belts is to prevent the wearer from striking sharp objects in the vehicle during an accident. Again, automobiles and school buses are not the same. School buses do not have steering wheels, dashboards, and door and window handles protruding into the passenger compartments. The only person in a school bus threatened by these objects is the bus driver, who wears a seat belt.

Other differences between automobiles and school buses

Passengers in school buses are protected by careful padding of seats, seat backs, sides and aisles. During a sudden impact the padding cushions students and absorbs most of the impact.

The outer construction of school buses and automobiles also is different. A school bus is encased in a metal frame much like a metal rib cage. In comparison, modern automobiles have little reinforcement. Also the passenger compartment in buses is well above the bumper height of automobile bumpers, so the impact of a collision is not at the same height as an automobile. And the impact is not as great on the passengers. This is the reason why interstate buses, public transit buses and school buses are exempt from safety belt requirements. They have a natural safety edge because they are bigger and heavier than automobiles and their interiors are designed to provide much more safety.

School buses are safer for other reasons as well. Other drivers easily see them because of their bright yellow color, flashing lights, special markings and low traveling speed. School buses are also recognized for

the special cargo they carry—our children. These factors make drivers more cautious around school buses.

Federal school bus standards

The National Highway Traffic Safety Administration in the 1970s studied how to improve the interior of the passenger compartment of school buses. The research, based on many crash tests, resulted in major seating and body design recommendations. The federal government used these recommendations to require bus manufacturers to change the way school bus interiors were designed. The design changes required in school buses made after April 1, 1977 were:

- Seats were redesigned to meet specific spacing requirements.
- Seats were to be fully padded in front and back. Seat backs were heightened. These newly designed seats provided a padded cavity for passengers—a concept called compartmentalization—which crash tests proved to provide the most effective protection in a collision.
- School bus bodies were greatly strengthened to withstand heavy impacts from the side, front and rear. Improvements also were made to school bus roofs for protection in case of roll over.

Improvements were made to school bus fuel tanks and lines to lessen the possibility of fuel spillage during collision.

Compartmentalization

How does compartmentalization work? Upon vehicle impact, an unbelted child will slide forward on the seat and into the padded back of the seat ahead. This distributes the forces of impact and injuries most likely will be minor. On the other hand, the lap-belted child's hips will act as a fulcrum, throwing the upper body forward with great force. This may cause severe injuries to the abdominal region because of the pressures involved.

3 Tests conducted by the Southwest Research Institute in 1977 showed

that 40 inches or more of unobstructed space is required in front of a lap-belted passenger to avoid upper body and head injuries. Since school bus seats are closely spaced, the lap-belted child's throat or head will most likely strike the back of the seat ahead during an accident. In such cases, the head or throat will receive all the forces of the impact and could result in severe physical injuries.

Positions

The National Highway Traffic Safety Administration, the National Safety Council, and the National School Transportation Association have stated that current school bus safety standards in force since 1977 provide adequate protection for school bus passengers. The following are the positions of those organizations:

National Highway Traffic Safety Administration

The U.S. Department of Transportation in Issue Paper HS-806-000 dated September, 1981 states:

"The National Highway Traffic Safety Administration agrees that children should be protected on school buses but does not support a requirement for seat belts for passengers in large school buses. Improving the seating compartment eliminates the need for seat belts and provides sufficient crash protection."

National Safety Council

The National Safety Council in its policy statement *Protecting Pupil Passengers in School Buses* dated June 28, 1984, states:

"The Council recommends that until further research and testing demonstrate that pupils will be safer by the installation of seat belts in school buses, the Council believes that passive protection provided by compartmentalization as required by the current (1977) federal standard on school bus seating and crash protection protects seated pupil passengers in school buses with gross vehicle weight ratings (GVWR) greater than 10,000 pounds."

National School Transportation Association

The Board of Directors of the National School Transportation Association (NSTA) in its Spring, 1984 special edition of *National School Bus Report*, states:

"Those of us who work with the children and school buses every day feel that every new item that is added or changed on school buses should be well tested and engineered prior to being mandated as a regulation. That is why NSTA will continue to support the compartmentalization concept until documented research establishes that seat belts on school buses will raise the level of protection for the occupants."

Canadian Government

School bus tests have shown that in some crashes belted passengers suffer more severe injuries than those not belted. A case in point is the most recent crash tests by the Canadian government.

In 1984 the Canadian government sponsored crash testing to determine the effectiveness of seat belts in three sizes of school buses. Results of the crash testing were summarized in the December 19, 1984 issue of the ***Bulletin***, published by the Supply and Services Division of the Canadian government, and a February 1985 technical memorandum on automotive safety entitled *School Bus Collision Tests*, published by Transport Canada of the Canadian government. These publications state:

"Transport Canada has reaffirmed that the safety features Canada (same as U.S. Federal Motor Vehicle Safety Standards) has incorporated into its school buses—well-padded, high-backed, energy-absorbing seats, spaced at controlled intervals—provide a safe environment without seat belts."

"The use of lap seat belts in any of the 3 sizes of recent model school buses which were tested may result in more severe head and neck injuries for a belted occupant than for an unbelted one in a severe frontal collision."

State of Arkansas

On March 25, 1983 a school bus accident in Jonesboro, Arkansas, killed nine persons including four students. The tragedy heightened concern for school bus safety among parents, interested citizens, school officials and legislators. Because of the accident, the Arkansas Legislature studied whether to install seat belts on school buses. In its September 20, 1984 report entitled *Feasibility of Requiring School Districts to Install Seat Belts on School Buses* the Arkansas Legislative Council concluded:

"It appears that based on the costs, the lack of data indicating a great fatality decline with the installation of seat belts, the possible dangers which could arise from the installation of the seat belts themselves, and the outstanding safety records of school buses in general, the issue of seat belts in school buses could be left as a decision to be made by individual school districts and should not be mandated by the legislature."

State of New Jersey

Independent groups in New Jersey have thoroughly studied over the last 15 years the subject of seat belts on school buses. The groups have not recommended installation of belts. A March 1, 1983 letter written by the New Jersey Department of Education regarding the research states:

"In any decision-making process involving the safety and well being of transported students, the bus internal and external safety environment must be carefully analyzed. Such questions as, 'Is what we are proposing more safe, less safe or as safe as what we already have?' (should be raised). It is apparent that there still are too many safety trade offs that, under highly critical questioning, prohibit mandated seat belts at this time."

State of Minnesota

In 1984 the Minnesota Legislature created a task force to answer concerns about school bus safety after fatal school bus accidents. The task force recommended against mandating seat belts in school buses.

State of Maryland

The Maryland Department of Education has concluded that seat belts would not improve the safety of pupils on school buses and may even present hazards to their safety. In the publication *Concerns about Seat Belts on School Buses* dated January, 1985, the department made these findings:

- If the bus rolls over on its side or roof during an accident, passengers may suffer serious injuries when releasing their seat belts because the bus roof would be three to four feet from their heads. Also, young children may find it difficult to unfasten a seat belt because of their suspended weight.
- If the school bus catches fire, particularly with unconscious children aboard, rescuers may not have enough time to release seat belts for as many as 60 children.

State of Alaska

The Department of Education in 1983 appointed a committee of school bus company representatives and school transportation officers to study school bus safety issues. In February 1985 the committee issued a resolution that since has been endorsed by the Alaska School Transportation Association and the Alaska Association for Pupil Transportation. The resolution states:

"The Alaska School Bus Safety Committee is agreed in its opinion that no legislative or regulatory action be taken in the State of Alaska to require seat belts on school buses until an authoritative body of test data has been produced showing conclusively that the overall safety of the ridership on pupil transportation buses is significantly enhanced."

The real danger

According to the National Safety Council, in 1983 55 pupils were killed in school bus accidents nationwide. Ten were school bus passengers and 45 were pedestrians approaching or leaving a loading zone.

Evidence does not show that fatalities inside the bus could have been prevented by seat belts. Most school bus accidents resulting in fatalities inside the bus involve another large vehicle such as a tractor-trailer combination or a railroad train. A section of the bus is usually torn away, intruded into or crushed. In these types of accidents it is sometimes evident that students would have suffered more severe injuries or even suffered a greater number of fatalities if they had been belted in some seat locations.

According to the National Safety Council, the greatest danger area for children is outside the school bus in an area known as "the loading zone." The loading zone is the area where pupils wait for the bus in the morning and get off the bus in the afternoon. Of the 45 fatalities in this area during 1983, more than half were killed when hit by the bus they regularly rode. The others were killed by motorists who failed to stop for school buses loading and unloading passengers.

The Alaska School Bus Safety Committee recommends that efforts be increased to lower loading zone fatalities. The committee's resolution:

"Alaska pupil transportation professionals should continue their ongoing efforts to reduce the incidence of external loading zone fatalities which exceed internal crash fatalities by a ratio of approximately 3 to 1 through state regulation of roadworthiness, in-depth school bus driver safety training, and preventative maintenance program for buses and that these same pupil transportation professionals should work diligently to develop a comprehensive program to promote loading and unloading zone safety awareness in the students' minds through classroom curriculum, in the motoring publics' mind through the public media, and in the parents' minds through use of parent-teacher associations and other concerned citizen groups."

Conclusion

The Department of Education has carefully reviewed available information about using seat belts in school buses. In light of the evidence, the department has concluded that it cannot support seat belt use in school buses until further testing shows that it is safer than compartmentalization.

Until such time, the department supports the position favoring compartmentalization of the National Highway Traffic Safety Administration, the National Safety Council and the National School Transportation Association.

The department also supports the Alaska School Bus Safety Committee's resolution that encourages greater efforts to reduce external loading zone fatalities. The department also encourages all concerned Alaskans to work with the Alaska School Bus Safety Committee in promoting programs on safety awareness in the loading and unloading zone area.

Alaska Department of Education
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